

**Amendments to the Claims:**

Following is a complete listing of the claims pending in the application, as amended:

1-123. (Cancelled)

124. (Currently Amended) A method of stimulating the brain of patient to effectuate a neural-function, comprising:

providing an image of neural activity specific to the cortex of the brain of a specific patient;

selecting a stimulation site ~~comprising a region of~~ at the cortex of the brain of the specific patient where a change in neural activity is expected to occur to carry out the neural-function based upon the provided image of neural activity specific to the patient; and

applying electrical stimulation to the stimulation site.

125. (Previously Presented) The method of claim 124 wherein applying electrical stimulation to the stimulation site comprises applying a signal having a voltage of less than about 10V directly to the stimulation site.

126. (Previously Presented) The method of claim 124 wherein applying electrical stimulation to the stimulation site comprises applying a signal having a voltage of approximately 50mV to 5V directly to the stimulation site.

127. (Currently Amended) ~~The method of claim 124~~ A method of stimulating the brain of patient to effectuate a neural-function, comprising:

providing an image of neural activity in the brain of the patient;

selecting a stimulation site comprising a region at the cortex of the brain of the patient where a change in neural activity is expected to occur to carry out the neural-function; and

applying electrical stimulation to the stimulation site, wherein applying electrical stimulation to the stimulation site comprises applying a signal that results

in an applied voltage approximately 10% greater than an expected resting potential of a population of neurons at the stimulation site.

128. (Currently Amended) The method of claim 127424 wherein applying electrical stimulation to the stimulation site comprises applying a signal that results in an applied voltage approximately 10-80% greater than an expected resting potential of a population of neurons at the stimulation site.

129. (Currently Amended) The method of claim 127424 wherein applying electrical stimulation to the stimulation site comprises applying a signal having a voltage effective to raise an expected resting potential of a population of neurons at the stimulation site by at least approximately 10-60% of a difference between the expected resting potential and an action potential for the population of neurons.

130. (Currently Amended) The method of claim 127424 wherein applying electrical stimulation to the stimulation site comprises applying a signal having a voltage effective to raise an expected resting potential of a population of neurons at the stimulation site by approximately 10-80% of a difference between the expected resting potential and an action potential for the population of neurons.

131. (Previously Presented) The method of claim 124, further comprising applying the electrical stimulation directly to the stimulation site.

132. (Previously Presented) The method of claim 124, further comprising applying the electrical stimulation directly to the stimulation site by implanting an electrode proximate to the cortex of the patient and aligned with the stimulation site.

133. (Previously Presented) The method of claim 132 wherein the electrode is placed in direct contact with the pial surface of the brain of the patient.

134. (Previously Presented) The method of claim 132 wherein the electrode is placed at the dura of the brain of the patient.

135. (Previously Presented) The method of claim 132 wherein the electrode is placed in contact with the dura of the brain of the patient.

136. (Previously Presented) The method of claim 124 wherein applying the electrical stimulation to the stimulation site comprises applying a signal having a frequency of less than approximately 1000Hz.

137. (Previously Presented) The method of claim 124 wherein applying the electrical stimulation to the stimulation site comprises applying a signal having a frequency of less than approximately 200 Hz.

138. (Previously Presented) The method of claim 124 wherein applying the electrical stimulation to the stimulation site comprises applying a signal having a frequency of approximately 40-200Hz.

139. (Previously Presented) The method of claim 124 wherein applying the electrical stimulation to the stimulation site comprises applying a signal having a frequency of approximately 50-100Hz.

140. (Previously Presented) The method of claim 124 wherein applying the electrical stimulation to the stimulation site comprises applying a signal with a pulse width of less than about 100 ms.

141. (Previously Presented) The method of claim 124 wherein applying the electrical stimulation to the stimulation site comprises applying a signal with a pulse width of less than about 200  $\mu$ s.

142. (Previously Presented) The method of claim 124 wherein applying the electrical stimulation to the stimulation site comprises applying a signal with a pulse width of less than about 100  $\mu$ s.

143. (Currently Amended) A method of stimulating the brain of a patient to effectuate a particular neural-function normally associated with a first location of the brain that has been impaired, comprising:

selecting a stimulation site comprising a region of the cortex in the brain of the patient where ~~a change in neural activity is expected to occur to carry out the neural-function~~, wherein the selected stimulation site is at a second location different from the first location; and

applying electrical stimulation directly to the cortex at the stimulation site.

144. (Previously Presented) The method of claim 143 wherein applying electrical stimulation to the stimulation site comprises applying a signal having a voltage of less than about 10V directly to the stimulation site.

145. (Previously Presented) The method of claim 143 wherein applying electrical stimulation to the stimulation site comprises applying a signal having a voltage of approximately 50mV to 5V directly to the stimulation site.

146. (Previously Presented) The method of claim 143 wherein applying electrical stimulation to the stimulation site comprises applying a signal having a voltage at least approximately 10% greater than an expected resting potential of a population of neurons at the stimulation site.

147. (Currently Amended) ~~The method of claim 143~~ A method of stimulating the brain of a patient to effectuate a particular neural-function, comprising:

selecting a stimulation site comprising a region of the cortex in the brain of the patient where a change in neural activity is expected to occur to carry out the neural-function; and

applying electrical stimulation directly to the cortex at the stimulation site, wherein  
applying electrical stimulation to the stimulation site comprises applying a signal having a voltage effective to raise an expected resting potential of a population of neurons at the stimulation site by at least approximately 10%

of a difference between the expected resting potential and an action potential for the population of neurons.

148. (Currently Amended) The method of claim 147~~143~~ wherein applying electrical stimulation to the stimulation site comprises applying a signal having a voltage effective to raise an expected resting potential of a population of neurons at the stimulation site by at least approximately 60% of a difference between the expected resting potential and an action potential for the population of neurons.

149. (Currently Amended) The method of claim 147~~143~~ wherein applying electrical stimulation to the stimulation site comprises applying a signal having a voltage effective to raise an expected resting potential of a population of neurons at the stimulation site by approximately 10-80% of a difference between the expected resting potential and an action potential for the population of neurons.

150. (Previously Presented) The method of claim 143, further comprising applying the electrical stimulation directly to the stimulation site.

151. (Previously Presented) The method of claim 143, further comprising applying the electrical stimulation directly to the stimulation site by implanting an electrode proximate to the cortex of the patient and aligned with the stimulation site.

152. (Previously Presented) The method of claim 151 wherein the electrode is placed in direct contact with the pial surface of the brain of the patient.

153. (Previously Presented) The method of claim 151 wherein the electrode is placed at the dura of the brain of the patient.

154. (Previously Presented) The method of claim 151 wherein the electrode is placed in contact with the dura of the brain of the patient.

155. (Previously Presented) The method of claim 143 wherein applying the electrical stimulation to the stimulation site comprises applying a signal having a frequency of less than approximately 1000Hz.

156. (Previously Presented) The method of claim 143 wherein applying the electrical stimulation to the stimulation site comprises applying a signal having a frequency of less than approximately 200 Hz.

157. (Previously Presented) The method of claim 143 wherein applying the electrical stimulation to the stimulation site comprises applying a signal having a frequency of approximately 40-200Hz.

158. (Previously Presented) The method of claim 143 wherein applying the electrical stimulation to the stimulation site comprises applying a signal having a frequency of approximately 50-100Hz.

159. (Previously Presented) The method of claim 143 wherein applying the electrical stimulation to the stimulation site comprises applying a signal with a pulse width of less than about 100 ms.

160. (Previously Presented) The method of claim 143 wherein applying the electrical stimulation to the stimulation site comprises applying a signal with a pulse width of less than about 200  $\mu$ s.

161. (Previously Presented) The method of claim 143 wherein applying the electrical stimulation to the stimulation site comprises applying a signal with a pulse width of less than about 100  $\mu$ s.

162. (Currently Amended) A method of stimulating the brain of patient to effectuate a particular neural-function, wherein the brain has an affected area, the method comprising:

providing an image of neural activity in ~~the cortex of the~~ brain of the patient;

selecting a stimulation site comprising a region of the cortex of the brain of the patient spaced apart from the affected area where a change in neural activity is expected to occur to carry out the neural-function; and  
applying an electrical signal directly to the stimulation site, wherein the signal has a voltage of less than 10V, a frequency less than approximately 1000Hz, and a pulse width less than approximately 100ms.

163. (Previously Presented) The method of claim 162, further comprising performing behavioral therapy on the patient related to a body part controlled by the particular neural-function while applying the electrical signal directly to the stimulation site.

164. (Previously Presented) The method of claim 162 wherein the patient has an impaired function because of a loss of the particular neural-function, and the method further comprises performing physical therapy on a body part of the patient controlled by the particular neural-function while applying the electrical signal directly to the stimulation site.

165. (Previously Presented) A method of stimulating the brain of patient to effectuate a neural-function, comprising:

providing an image of neural activity in the cortex of the brain of the patient;  
selecting a stimulation site comprising a region of the cortex of the brain of the patient where a change in neural activity is expected to occur to carry out the neural-function;  
applying an electrical signal directly to the stimulation site, wherein the signal is sufficient to provide a potential to the stimulation site that is approximately 10-80% greater than an expected resting potential of a population of neurons at the stimulation site.

166. (Previously Presented) The method of claim 165, further comprising performing behavioral therapy on the patient related to a body part controlled by the

particular neural-function while applying the electrical signal directly to the stimulation site.

167. (Previously Presented) The method of claim 165 wherein the patient has an impaired function because of a loss of the particular neural-function, and the method further comprises performing physical therapy on a body part of the patient controlled by the particular neural-function while applying the electrical signal directly to the stimulation site.

168. (New) A method of stimulating the brain of a patient to effectuate a particular neural-function, comprising:

- selecting a stimulation site comprising a region at the cortex in the brain of the patient where neuroplasticity is expected to occur to carry out the neural-function; and
- applying electrical stimulation directly to the cortex at the stimulation site.

169. (New) A method of stimulating the brain of a patient to effectuate a particular neural-function, comprising:

- selecting a stimulation site comprising a region of the primary motor cortex and/or sensory motor cortex in the brain of the patient to carry out the neural-function; and
- applying the electrical stimulation directly to the stimulation site at the primary motor cortex and/or sensory motor cortex.

170. (New) A method of stimulating the brain of a patient to effectuate a particular neural-function, comprising:

- assessing a symptom associated with stroke;
- selecting a stimulation site comprising a region of the cortex in the brain of the patient where neural activity is expected to occur to carry out a neural-function associated with the stroke symptom; and
- applying electrical stimulation directly to the cortex at the stimulation site.



171. (New) The method of claim 170 wherein the stimulation site is located in the pre-motor cortex, motor cortex, and/or sensory cortex.

172. (New) The method of claim 170 wherein selecting a stimulation site further comprises (a) peripherally initiating neural activity associated with the stroke symptom and (b) determining where the neural activity associated with the stroke symptom occurs in response to the peripheral stimulation.

173. (New) A method of stimulating a brain of a patient to effectuate a particular neural-function, comprising:

assessing a movement disorder in the patient;

selecting a stimulation site comprising a region of the cortex in the brain of the patient where neural activity is expected to occur to carry out the movement disorder; and

applying electrical stimulation directed to the cortex at the stimulation site.